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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/786,064 | 02/26/2004 | Naoki Maeda | 1560-0408P | 3297 |
| 2292 | 7590 | 01/12/2005 | EXAMINER | |
| BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747 | | | MARTIR, LILYBETT | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2855 | |

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------------------|------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/786,064 | MAEDA ET AL. | |
| | Examiner Lilybett Martir | Art Unit 2855 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/26/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ichikawa et al. (Pat. 4,764,767).

With respect to claim 1, Ichikawa et al. teaches a plurality of detecting means as in elements 1 and 2, disposed respectively to face a target as are elements 3a and 3b made of a magnetic material (Col.4, lines 4-10) and provided on a rotating member 3, for detecting the target and outputting detection signals having phases according to the position of the target which changes with a rotation of the rotating member (Col. 5, lines 26-65); operating means 10 for operating a predetermined operation on the detection signals respectively outputted from the detecting means; converting means 11 for converting a result the operation operated by the operating means into the electrical angle of the detection signals based on ones of a plurality of tables and a plurality of conversion formulas, said tables representing the correlation of each operation result obtained by operating the determined operation by the operating means in advance for different gaps between the target and

the detecting means with a corresponding electrical angle of the detection signals, and said conversion formulas representing the relationship between the operation result and the electrical angle of the detection signals for different gaps between the target and the detecting means; and determining means for determining the gap based on the detection signals respectively outputted from the detecting means, wherein the converting means converts the result of the operation operated by the operating means into the electrical angle of the detection signals based on one of the table and the conversion formula corresponding to the gap determined by the determining means, and detects a rotational angle of the rotating member based on the obtained electrical angle (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

With respect to claim 2, Ichikawa et al. teaches means for determining whether or not the gap determined by the determining means is one of the gaps corresponding to ones of a plurality of the tables and a plurality of the conversion formulas as is elements 25 and 26; and calculating means 11 for calculating the electrical angle of the detection signals by interpolation based on ones of two tables and two conversion formulas corresponding to two gaps on both sides of h determined by the determining means, if the determination gap result by the means is

negative (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

With respect to claim 3, Ichikawa et al. teaches the calculating means 11 calculates the electrical angle of the detection signals based on the operation results obtained by operating the predetermined operation by the operating means in advance for two gaps on both sides of the gap determined by the determining means, the electrical angles of the detection signals obtained by converting the operation results by converting means, and the result of the operation operated the predetermined operation on the detection signals respectively outputted from the detecting means by the operating means (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

With respect to claim 4, Ichikawa et al. teaches a plurality of detectors as in elements 1 and 2, disposed respectively to face a target made of a magnetic material as are elements 3a and 3b and provided on a rotating member 3, for detecting the target and outputting detection signals having phases according to the position of the target which changes with a rotation of the rotating member; and a controller as in elements 10 and 11 capable of performing operations of executing a predetermined

operation on the detection signals respectively outputted from the detectors; storing ones of a plurality of tables and a plurality of conversion formulas, said tables representing the correlation of each operation result obtained by executing the predetermined operation in advance for different gaps between the target and the detectors with a corresponding electrical angle of the detection signals, said conversion formulas representing the relationship between the operation result and the electrical angle of the detection signals for different gaps between the target and the detectors; determining the gap based on the detection signals respectively outputted from the detectors; converting the result of the executed operation into the electrical angle of the detection signals based on one of the table and the conversion formula corresponding to the determined gap; and detecting a rotational angle of the rotating member based on the obtained electrical angle (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

With respect to claim 5, Ichikawa et al. teaches a controller as in elements 10 and 11 capable of determining whether or not the determined gap is one of the gaps corresponding to ones of a plurality of the tables and a plurality of the conversion formulas, and calculates the electrical angle of the detection signals by interpolation based on ones of

two tables and two conversion formulas corresponding to two gaps on both sides of the determined gap, if the determination result is negative (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

With respect to claim 6, Ichikawa et al. teaches a controller as in elements 10 and 11 capable of calculating the electrical angle of the detection signals based on the operation results obtained by executing the predetermined operation in advance for the two gaps on both sides of the determined gap, the electrical angles of the detection signals obtained by converting the operation results, and the result of the operation executed the predetermined operation on the detection signals respectively outputted from the detectors (Col. 6, lines 11-68, Note that the only means taught by the applicant comprise a calculation processing circuit with no specific structure, equivalent to what elements 10 and 11 are).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al. in view of Ballantyne (Pat. 5,675,095).

- With respect to claim 7-12, Ichikawa et al. teaches his arrangement being used in only one shaft and fails to teach the rotational angle detecting apparatus provided for each of a first shaft and a second shaft connected by a connection shaft; and detecting means for detecting a torque applied to one of the first shaft and the second shaft based on rotational angles of the first shaft and the second shaft detected by the rotational angle detecting apparatuses provided for the first shaft and the second shaft, respectively. Ballantyne teaches the utilization of plural rotational detectors 4 in a torque measurement arrangement, where said rotational angle detecting apparatus 4 are provided for each of a first shaft 1 and a second shaft 2 connected by a connection member 3; said detectors detecting a torque applied to one of the first shaft and the second shaft based on rotational angles of the first shaft and the second shaft detected by the rotational angle detecting apparatuses provided for the first shaft and the second shaft (Col. 1, lines 9-17 and Col. 3-4, lines 65-9), as being well known in the art. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the rotational detection device of Ichikawa et al. utilizing the teachings of the torque sensor of Ballantyne by arranging in

said sensor in a first shaft and a second shaft arrangement to make said device versatile and adaptable.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (571)272-2182. The examiner can normally be reached on 9:00 AM to 5:30 PM.
6. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LM
Lilybett Martir
Examiner
Art Unit 2855

LM


EDWARD LEFKOWITZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800